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EXAMINER	
KALAM, ABUL	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/758,228	LAM ET AL.	
	Examiner	Art Unit	
	Abul Kalam	2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12-59* is/are pending in the application.

4a) Of the above claim(s) *18-59* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10 and 12-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 January 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Election/Restrictions

1. Applicant's election without traverse of Species I, drawn to claims 1-10 and 12-17, in the reply filed on February 8, 2007, is acknowledged.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6, 10 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Eguchi et al. (5,623,476, previously cited, hereinafter, Eguchi).

With respect to claim 1, Eguchi teaches a data storage device (fig. 1) comprising:

a storage medium (1) comprising;

an electrode (103); and

an electrolyte layer (101) positioned on the electrode;

a conductive layer ("the metal electrode of the recording medium," col. 14: lns. 49-54) positioned on the electrolyte layer (101);

at least one probe (102) configured to contact the conductive layer, wherein the conductive layer is positioned between the at least one probe and the electrolyte layer (col. 13: lns. 41-57, col. 14: lns. 24-63); and

a voltage supply device (108) configured to supply voltage through the at least one probe and the electrode to thereby create a circuit between the at least one probe

and the electrode, wherein the level of voltage supplied by the at least one probe allows at least one of writing, reading, and erasing operations on one or more memory cells of the storage medium (col. 15, lns. 13-23; col. 18, lns. 53-67; col. 19, lns. 1-18).

With respect to claim 2, Eguchi teaches the device according to claim 1 as set forth above, wherein the electrode comprises one or more of gold, silver, copper, platinum, iridium, and palladium (col. 14, lns. 35-48).

With respect to claim 3, Eguchi teaches the device according to claim 1 as set forth above, wherein the electrolyte layer comprises a chalcogenide-metal composition (col. 13, lns. 41-55).

With respect to claim 4, Eguchi teaches the device according to claim 3 as set forth above, wherein the chalcogenide-metal composition comprises one or more of arsenic, germanium, selenium, sulfur, oxygen, tellurium, and antimony (col. 13, lns. 41-55).

With respect to claim 6, Eguchi teaches the device according to claim 1 as set forth above, wherein one or both of the storage medium and the at least one probe are movable with respect to each other (col. 18, lns. 59-65).

With respect to claim 10, Eguchi teaches the device according to claim 1 as set forth above, wherein the at least one probe comprises an inverted conical tip configured to contact the conductive layer (col. 14: lns. 49-63)

With respect to claim 12, Eguchi teaches the device according to claim 1 as set forth above, including wherein the conductive layer comprises at least one of such as gold, silver, platinum, iridium, and palladium (col. 14, lns. 35-48).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 5, 7-9 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eguchi ('476, cited above) as applied to claims 1, 3, and 11 above, and further in view of Moore et al. (US 2005/0122757, previously presented, hereinafter Moore).

With respect to claim 5, Eguchi teaches all the limitations of the claim, as set forth above in claims 1 and 3, with the exception of explicitly disclosing:

wherein the chalcogenide-metal composition comprises silver.

However, Moore teaches wherein the chalcogenide-metal composition comprises silver (pg. 1, [0006]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the chalcogenide-metal composition of Eguchi to include silver in the chalcogenide-metal composition, as taught by Moore, because this is well known in the art of manufacturing PCRAM structures.

With respect to claims 7-9, Eguchi teaches all the limitations of the claim, as set forth above in claim 1, with the exception of disclosing:

with respect to claim 7, wherein the voltage supplied comprises a first voltage configured to perform a write operation in one or more memory cells of the storage medium, said first voltage being sufficiently high to form a metallic dendrites in the electrolyte layer at the locations of the one or more memory cells;

with respect to claim 8, the device of claim 7 wherein the voltage supplied comprises a second voltage configured to perform an erase operation in one or more memory cells of the storage medium, said second voltage having a reverse bias as compared to the first voltage, wherein the second voltage is operable to render a less conductive path in the electrolyte layer at the locations of the one or more memory cells;

and with respect to claim 9, the device of claim 7 wherein the voltage supplied comprises a third voltage configured to perform a read operation on one or more memory cells of the storage medium, wherein the third voltage is a lower voltage than the first voltage or the second voltage and is sufficiently weak to cause little modification of the memory cell, said device further comprising: a resistance measuring device configured to detect the resistance between the at least one probe and the electrode.

However, Moore discloses a memory cell device in which a voltage supply device is configured to supply a first voltage to perform a write operation in one or more memory cells (110) of the storage medium, said first voltage being sufficiently high to form dendrites in the electrolyte layer at the locations of the one or more memory cells (pg. 4, [0050]-[0051]).

More also teaches wherein the voltage supply device is configured to supply a second voltage to perform an erase operation in one or more memory cells of the

storage medium, said second voltage having a reverse bias as compared to the first voltage, wherein the second voltage is operable to render a less conductive path in the electrolyte layer at the locations of the one or more memory cells (fig. 6; pg. 4, [0045]).

Furthermore, More teaches wherein the voltage supply device is configured to supply a third voltage to perform a read operation on one or more memory cells of the storage medium, wherein the third voltage is a lower voltage than the first voltage or the second voltage and is sufficiently weak to cause little modification of the memory cell (fig. 5; pg. 3, [0043]), said device further comprising:

a resistance measuring device configured to detect the resistance between the at least one probe and the electrode (pgs. 3-4, [0044]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Eguchi with the teachings of Moore, to supply three different voltages to perform the read, write, and erase operations, thus forming non-volatile memory devices capable of high long-term data integrity, rapid writing and erasure of data, and rapid addressing and reading of stored data.

With respect to claim 13, Eguchi teaches all the limitations of the claim, as set forth above in claims 1 and 11, with the exception of explicitly disclosing:

wherein the conductive layer comprises a plurality of discrete conductive elements spaced apart from each other discontinuously, wherein the plurality of discrete conductive elements are associated with memory cells.

However, Moore teaches a data storage device (figs. 1, 10, and 11) composed of memory cells (110) wherein a conductive layer (114) is comprised of a plurality of discrete conductive elements spaced apart from each other discontinuously (fig. 11), wherein the plurality of conductive elements are associated with memory cells (pg. 4, [0050]-[0051]).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the device of Eguchi with the teaching of Moore, to have the conductive layer comprised of plurality of conductive elements, which are associated with memory cells, for the purpose of using the memory cells in programmable conductive memory elements, thus improving power consumption and enhancing the operating speed of devices with the memory components (pg. 1, [0008]).

With respect to claim 14, Eguchi and Moore teach the device of claim 13 as set forth above, and Moore further teaches wherein the electrode (116) is sized and positioned to create an electric circuit with the plurality of discrete conductive elements (114) (pg. 3, [0042]; pg. 4, [0051]).

With respect to claim 15, Eguchi and Moore teach the device of claim 14, as set forth above, and Moore teaches the device further comprising:

wherein the voltage supplied comprises a first voltage configured to perform a write operation at the locations of the discrete conductive elements, said first voltage being sufficiently high to form dendrites in the electrolyte layer at the locations of the one or more memory cells associated with the discrete conductive elements (fig. 4; pg. 3, [0040]-[0042]).

With respect to claim 16, Eguchi and Moore teach the device of claim 15, as set forth above, and Moore further teaches wherein the voltage supplied comprises a second voltage configured to perform an erase operation at the locations of the discrete conductive elements, said second voltage having a reverse bias as compared to the first voltage, wherein the second voltage is operable to render less conductive in the electrolyte layer at the locations of the one or more memory cells associated with the discrete conductive elements (fig. 6; pg. 4, [0045]).

With respect to claim 17, Eguchi and Moore teach the device of claim 16, as set forth above, and Moore further teaches wherein the voltage supplied comprises a third voltage configured to perform a read operation at the locations of the discrete conductive elements, wherein the third voltage is a lower voltage than the first voltage or the second voltage and is sufficiently weak to cause little modification of the memory cell (fig. 5; pg. 3, [0043]), said device further comprising:

a resistance measuring device configured to detect the resistance between the at least one probe and the electrode at the locations of the one or more memory cells associated with the discrete conductive elements, said resistance being lower in those memory cells (pgs. 3-4, [0044]).

Response to Arguments

Applicant's arguments filed October 12, 2006 have been fully considered but they are not persuasive.

Applicant argues that Eguchi fails to disclose a conductive layer position on an electrolyte layer. Applicant's reasoning is that "the metal electrode of the recording medium" and the electrode 103 are the same layers. This is not persuasive because Eguchi states in col. 14: lns. 49-54, "the metal electrode of the recording medium," is required if the recording layer in the present invention is insulating. Eguchi also states the metal electrode is not required when the recording layer has a low resistance, and thus the recording layer can be used as the counter electrode of the probe electrode (col. 14: lns. 51-54). This implies that recited metal electrode of the recording medium also functions as the counter electrode of the probe electrode, and thus is not the same as electrode 103.

Applicant argues that the combination of Eguchi and Moore is improper because the probe electrode 102 of Eguchi performs the same function as the first electrode 114 of Moore. This is not persuasive because the first electrode does not apply various voltages to the cell, as argued by the Applicant, but rather voltages are applied to first electrode structure by an electrode line 42. On page 3, paragraph [0038], Moore states the voltages applied between the first electrode 114 and second 116, for purposes of reading, writing and erasing the cell 110, is controllable by applying appropriate electrical potentials to the first electrode structure 114. Thus, voltages are applied to Moore's first electrode structure 114, and thus is similar to the function of Eguchi's "metal electrode of the recording medium."

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abul Kalam whose telephone number is 571-272-8346. The examiner can normally be reached on Monday - Friday, 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

PHAT X. CAO
PRIMARY EXAMINER